

THE INVENTION CLAIMED IS

1. A compact imaging spectrometer apparatus, comprising:
 - an entrance slit for directing light,
 - lens means for receiving said light, refracting said light, and focusing said light;
 - an immersed diffraction grating that receives said light from said lens means and deflects said light, said immersed diffraction grating directing said deflected light back to said lens means; and
 - a detector that receives said light from said lens means.
2. The compact imaging spectrometer apparatus of claim 1 wherein said lens means for receiving said light, refracting said light, and focusing said light is a Germanium lens.
3. The compact imaging spectrometer apparatus of claim 1 wherein said immersed diffraction grating has rulings in a germanium surface.
4. The compact imaging spectrometer apparatus of claim 1 wherein said immersed diffraction grating has 115 lines/mm.
5. The compact imaging spectrometer apparatus of claim 1 wherein said imaging spectrometer apparatus has a front and a back and wherein said slit, said lens means, said immersed diffraction grating, and said detector fit within an envelope located between said front and said back.
6. The compact imaging spectrometer apparatus of claim 5 wherein said envelope is 3.2 cm by 1.9 cm by 1.2 cm or smaller.
7. The compact imaging spectrometer apparatus of claim 1 wherein said detector is a 2D detector.

8. The compact imaging spectrometer apparatus of claim 1 wherein said immersed diffraction grating has a refractive surface and is spherical or aspheric on its refractive surface.

9. The compact imaging spectrometer apparatus of claim 1 wherein said immersed diffraction grating has a refractive surface and is an anamorphic asphere on its refractive surface.

10. The compact imaging spectrometer apparatus of claim 1 wherein said immersed diffraction grating has a grating surface and is spherical or aspheric on its grating surface.

11. The compact imaging spectrometer apparatus of claim 1 wherein said lens has a surface and is an anamorphic asphere on its surface.

12. The compact imaging spectrometer apparatus of claim 1 wherein said immersed grating consists of 2 or more prisms.

13. The compact imaging spectrometer apparatus of claim 1 wherein said lens consists of two or more lenses that are coaxial.

14. The compact imaging spectrometer apparatus of claim 1 wherein said lens consists of two or more lenses that are not coaxial.